

Claims

I claim:

1 1.-A system for measuring dynamic force of impacting air/water spray
2 comprising:

3 a pitot-tube section being aligned to receive a longitudinal flow
4 of an impacting spray of air and water in a laterally extending
5 orifice; a first differential pressure transducer being coupled to
6 said pitot-tube section for producing signals representative of
7 velocity of said air/water spray at said orifice;

8 a rain gage section adjacent to said pitot-tube section, said
9 rain gage section receiving and collecting volumes of water of said
10 longitudinal flow of said air/water spray through a laterally
11 extending opening;

12 a second pressure differential transducer coupled to said rain
13 gage section for producing signals representative of said volumes of
14 water collected in said rain gage section; and

15 a computer-based control/readout module connected to receive said
16 velocity representative signals and said water volume representative
17 signals for indicating the magnitude of dynamic force attributed to
18 impacting air/water spray in said opening.

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2 2.-The system of claim 1 wherein said pitot-tube section has
3 orthogonally interconnected first and second lengths of rigid tubing,
4 and said rain gage section has orthogonally interconnected horizontal
5 and vertical capture tubes.

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1 3.-The system of claim 2 wherein said first rigid tubing is aligned
2 with said longitudinal flow of said air/water spray to face said
3 orifice laterally extending across said longitudinal flow of said
4 air/water spray, and said first differential pressure transducer is
5 coupled to said second rigid tubing for producing said velocity
6 representative signals.

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1 4.-The system of claim 3 wherein said horizontal capture tube is
2 aligned with said longitudinal flow of said air/water spray to face
3 said opening laterally extending across said longitudinal flow of said
4 air/water spray to receive and collect water of said air/water spray,
5 said second pressure differential transducer is coupled to said
6 vertical capture tube for producing said water volume representative
7 signals.

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1 5.-The system of claim 4 wherein said first pressure differential
2 transducer produces said velocity representative signals corresponding
3 to pressure at said orifice, said second pressure differential
4 transducer produces said water volume representative signals
5 corresponding to pressure in said vertical pressure tube.

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1 6.-The system of claim 5 wherein said first and second differential
2 pressure transducers are coupled to receive static ambient pressure.

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1 7.-The system of claim 6 further comprising:

2 a first purge valve connected to said second rigid tubing and
3 said module to receive said first control purge signal for selectively
4 purging water from said pitot-tube section; and

5 a second purge valve connected to said vertical spray capture
6 tube and said module to receive said second control purge signal for
7 selectively purging collected water volumes from said rain gage
8 section.

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1 8.-The system of claim 7 wherein said computer-based control/readout
2 module selectively produces first and second control purge signals,
3 said first and second purge signals being selectively coupled to said
4 first and second purge valves, respectively.

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1 9.-The system of claim 8 wherein said first control purge signal are
2 coupled to said first purge valve for selectively purging water from
3 said pitot-tube section, said second control purge signals are
4 coupled to said second purge valve connected for selectively purging
5 collected water volumes from said rain gage section.

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1 10.-The system of claim 9 further comprising:

2 a pump in said first purge valve to speed up purging of water
3 from said pitot-tube section; and

4 a pump in said second purge valve to speed up purging of water
5 from said rain gage section.

1 11.-The system of claim 10 further comprising:

lengths of flexible tubing connecting said first and second differential pressure transducers to said static ambient pressure.

12.-A system for measuring dynamic force of impacting air/water spray comprising:

means for determining velocity of an impacting spray of air and water, said air/water spray velocity determining means being aligned with the longitudinal flow of said air/water spray, having an laterally extending orifice receiving said air/water spray, and having a first differential pressure transducer for producing a signal representative of velocity of said air/water spray at said orifice;

means adjacent said air/water spray velocity determining means for collecting at least one volume of water, said water volume collecting means being aligned with the longitudinal flow of said air/water spray, having a laterally extending opening to receive and collect water of said air/water spray, and having a second differential pressure transducer for producing a signal representative of a collected volume of water of said air/water spray; and

means connected to receive said velocity representative signal from said air/water spray velocity determining means and said water volume representative signal from said water volume collecting means for producing an indication of the magnitude of impacting dynamic force produced.

13.-The system of claim 11 further comprising:

means connected to said air/water spray velocity determining

1 means and said indication producing means for selectively purging any
2 water from said air/water spray that might have collected in said
3 air/water spray velocity determining means; and

4 means connected to said water volume collecting means and said
5 indication producing means for selectively purging said collected
6 volume of water from said water volume collecting means.

7 14.-A method of measuring dynamic force of impacting air/water spray
8 comprising the steps of:

9 receiving a longitudinal flow of an impacting spray of air and
10 water in a laterally extending orifice of a pitot-tube section;

11 producing signals representative of pressure representative of
12 velocity of said air/water spray at said orifice by a first

13 differential pressure transducer coupled to said pitot-tube section;

14 receiving and collecting volumes of water of said longitudinal
15 flow of said air/water spray through a laterally extending opening of
16 a rain gage section adjacent to said pitot-tube section;

17 producing signals representative of said volumes of water
18 collected in said rain gage section by a second pressure differential
19 transducer; and

20 indicating the magnitude of dynamic force attributed to impacting
21 air/water spray in said opening by a computer-based control/readout
22 module connected to receive said velocity representative signals and
23 said water volume representative signals.

1 15.-The method of claim 14 further comprising the steps of:

2 orthogonally interconnecting first and second lengths of rigid

1 tubing in said pitot-tube section; and

2 orthogonally interconnecting horizontal and vertical capture
3 tubes in said rain gage section.

1 16.-The method of claim 15 further comprising the steps of:

2 aligning said first rigid tubing with said longitudinal flow of
3 said air/water spray to face said orifice laterally extending across
4 said longitudinal flow of said air/water spray; and

5 coupling said first differential pressure transducer to said
6 second rigid tubing for producing said velocity representative
7 signals.

1 17.-The method of claim 16 further comprising the steps of:

2 aligning said horizontal capture tube with said longitudinal
3 flow of said air/water spray to face said opening laterally extending
4 across said longitudinal flow of said air/water spray to receive and
5 collect water of said air/water spray; and

6 coupling said second pressure differential transducer to said
7 vertical capture tube for producing said water volume representative
8 signals.

1 18.-The method of claim 17 further comprising the steps of:

2 producing said velocity representative signals corresponding to
3 pressure at said orifice by said first pressure differential
4 transducer; and

5 producing said water volume representative signals corresponding

6 to pressure in said vertical pressure tube by said second pressure
7 differential transducer.

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1 19.-The method of claim 7 further comprising the steps of:

2 coupling first and second control purge signals from said
3 computer-based control/readout module to first and second purge
4 valves, of said pitot-tube section and rain gage section,
5 respectively; and

6 purging water from said pitot-tube section and said rain gage
7 section.

1 20.-The method of claim 19 further comprising the steps of:

2 speeding up the step of purging of water from said pitot-tube
3 section with a pump in said first purge valve; and

4 speeding up the purging of water from said rain gage section with
5 a pump in said second purge valve.

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